

Public doesn't appreciate risk/adventure/spinoffs of NASA missions. HST and Mars rovers seem to get 80% public recognition but much lower for human spaceflight/Shuttle/ISS/Constellation. Great appreciation for NASA but not much depth of understanding. Uncertainty in current NASA direction and public perception of situation don't help in addition to job layoffs. NASA brand recognition is great but need to change "so what" to "what happens next?"

Teaching From Space Program (TFSP). There will be more education downlink opportunities with crew members on ISS. Currently supporting 20 education downlinks (http://www.nasa.gov/mission_pages/station/science/experiments/Inflight_Education_Downlinks.html) per year; 50-100 ARISS contacts (http://www.nasa.gov/mission_pages/station/science/experiments/ARISS.html) per year. Downlinks ~20 minutes each so ~400 minutes per year. **Can the committee do anything to help increase that time?** Downlinks and ARISS contacts are competitively selected. **What about conducting standing weekly/bi-weekly downlinks/show since questions from students tend to be the same?** NASA currently also supports on orbit payload operations where astronauts conduct demos w/talking points a la Don Pettit. **What is the tall pole...ISS partners?** Time constraints for crew time. HST IMAX film is huge success, shows the personal side, kids respond much more. **Consider NASA "reality" programming, education opportunities should be a priority.** E/PO gets 2 pots of time: 1) via payload operations for science demos but doesn't go out live, goes into eClips (<http://www.nasa.gov/audience/foreducators/nasaclips/index.html>) that get posted online. Time varies depending on ISS schedule; have done 12-14 per increment. 2) opportunities via Public Affairs e.g. Channel One broadcast to increase participation. These are targeted to K-12 educators and students not college students/teachers. **Opportunity for committee to submit recommendation e.g. ways to streamline competitive process, increase number and awareness of opportunities?** The most effective way to reach educators is face to face. NASA hires educators, partners with education organizations like the National Science Teachers Association (NSTA), and supports education conventions. NSTA has an online newsletter that promotes NASA opportunities. NSTA's membership is ~30K although there are ~3 million science teachers. NASA diversification of partners is needed and we're working on it e.g. NEON (<http://neon.intronetworks.com/#>). In general, teachers teach to tests which leaves little time/energy for incorporating NASA content.

Robotics. Cool DIY in-school demos available like robonaut fingers, end effector. **How does NASA interface with FIRST?** Participation in FIRST costs about \$4K per team and is intense. Teams are taught how to get contributions from community organizations. For underserved schools, FIRST doesn't tend to be considered/an option; however the Aerospace Education Services Project (AESP) (http://www.nasa.gov/offices/education/programs/descriptions/Aerospace_Education_Services_Project.html) was successful with an underserved school who later went on to be the world champion at the competition in Japan. While NASA is not a FIRST program, NASA has been instrumental in connecting virally via "endorsement"/"promotion". The robotics offices at NASA centers provide mentors and some funding. **How can the committee help?** Time and money are limiting factors. Schools teach to the tests so educators have limited time to learn how to participate etc...must participate on volunteer time.

Developing partnerships would be helpful. Challenge is getting info into teacher hands as well as competing for their time.

High School Aerospace Scholars (HAS) (<http://aerospacescholars.jsc.nasa.gov/HAS/>). JSC/partners investment ratio is 7:1. Program is only being conducted in a few states e.g. TX, VA, WA, and ID; funding differs depending on the state. Need to get out to all states; locations differ depending on states like a franchise. There isn't yet a timeline in which NASA will connect all 50 states. **Possible recommendation for NASA HQ to corral the effort.** It's a fairly new program so maybe need a plan to grow; funding is an issue i.e. competition with other NASA programs.

ISS National Lab (http://www.nasa.gov/mission_pages/station/science/nlab/).

NASA Report to Congress

http://www.nasa.gov/pdf/181149main_ISS_National_Lab_Final_Report_rev2.pdf

Education Design Team (see attached presentation). Common issue is awareness of NASA programs by education communities. NASA has so many programs that signal-to-noise ratio is a problem e.g. lots of information but signal is weak. The President's Council of Advisors on Science and Technology (PCAST) <http://www.whitehouse.gov/administration/eop/ostp/pcast/about> has issued 130 pages of recommendations for STEM education

<http://www.whitehouse.gov/administration/eop/ostp/pcast/docsreports>; NASA had some input into the report. Out of NASA's education budget (\$140M) only \$10M is discretionary i.e. not **earmarks directed spending such as like** Space Grant, MUREP, EPSCOR. NASA Center Education offices also receive money from NASA missions/programs and center directors. Summer of Innovation model development is in work.

PCAST Findings on NASA's Education Program

- NASA's content is inspiring and its program is well aligned with the Agency's strategy.
- Not necessarily in alignment with broader (national) educational goals, and
- Measures output more than outcome making it difficult to assess the program's quality and impact.

Issue with measuring **output-outcome** is that it requires about 10-15% of a program's budget **to ascertain**. How can NASA leverage partnerships to do that **economically-efficiently** and effectively? NASA is also **constrained-unable to** conduct longitudinal studies so must **leverage-partner with organizations that can-for that**. NASA needs to figure out **how to get the** biggest bang for its education budget. **NASA's** Office of Communications budget **has been** cut to the bone. **If you consider the recent Kids Page newspaper insert describing the retirement of the Shuttle, the current-NASA-human spaceflight-situation-way NASA presented its future human spaceflight program may be is-**demotivating to students. **-Washington Post's Kids Post as a model?** <http://www.washingtonpost.com/wp-dyn/content/print/kidspost/> **Can commercial space help? More kids inspired to work for Elon Musk now rather than NASA.** Office of Communications and Office of Education need to work on inspirational messaging together, "We're increasing opportunities and expanding number of partners. Going to space will get easier for more people." Suggestion for NASA to partner with the Department of Education on developing Race to the Top (RTTP) proposals.?

<http://www2.ed.gov/programs/racetothetop/index.html> What about strategic partnerships e.g. NFL connection, Mary J. Blige Foundation? Requires evaluation to ensure investment is worthwhile. With Unified Labor Account, considering all NASA employees and contractors to serve some of their work time as educational or inspirational ambassadors. Regarding ~~state~~ education standards, they vary from state to state so there is no one-size-fits-all ~~space~~ making it challenging to develop material that will work in all states and districts as a platform to teach is challenging. Could NASA assist in developing national education standards e.g., climate change. The Department of Education (Michael Lach) suggested that NASA should ~~We need to~~ target the 25% of students who are proficient in STEM but not interested as well as the 15% who are not proficient but interested at the 12th grade level. Between 9th and 12th grade ~~more a higher percentae of~~ students are STEM proficient but there are fewer students in the STEM pipeline. The Education Design Team provided pP preliminary recommendations presented to the NASA Administrator:

- Develop a mission and vision—unifying narrative—for NASA Education
- Focus education programs/projects—fewer programs with more resources
 - Take a systems approach to design NASA's education program
 - Consider NASA's education legacy and need for change management
- Foster strategic partnerships (government, foundations, commercial)
- Participate in the development of national STEM education policy
- Evaluate the Office of Education's role, structure, and skills
- Invest in infrastructure improvements (portfolio and data management, evaluation, streamlined solicitations, social media, etc.)
- Increase program/project management discipline (policy, ECC as a PMC)
- Examine NASA's unified labor account to enable volunteerism
- Enhance strategic communications, both externally and internally
- Develop realistic timeline and expectations for implementation

NASA programs like SEMAA

<http://www.nasa.gov/offices/education/programs/national/semaa/home/index.html> have impressive outcomes but NASA has taken ~~it the program~~ as far as possible with the resources available...does SEMAA provide an opportunity to spinoff the successful model to a partner? The final recommendations are due to the Administrator by the end of October. **Doug King will take the lead on the committee's behalf to work with the Education Design Team and possibly participate in the Educators Launch Conference scheduled for Oct 31-Nov 1.** PCAST may help NASA get bang for the buck with mandated programs, ~~e.g. Space Grant~~. Suggestion to form team including legislative representatives to create win-win situation, need coherent strategy going in. PCAST: how are you innovative in your approach to STEM education? Need to meet learners where they're at.

Wings in Orbit. Online version of commemorative Shuttle program book due out in November will contain links to related content. Would need partners to make versions for iPad, Kindle. NASA not profiting; any dollars go to the Treasury Department. If GPO makes money on the project, could that be designated to NGO's e.g. Challenger Center. GPO is looking to partner with publishers. There are currently 2000 orders and GPO is evaluating the demand and working to raise pre-order count. **Possible recommendation that Wings in Orbit be provided to school libraries.**

Space Week. Any TV, radio advertizing done was the result of a NASA advisory i.e. no monetary investment by NASA. Need to expand national reach. Other centers have Space Days. JSC is benchmarking.

Astronaut Mark Kelly on Tweeting. Many astronauts tweet, some more than others, and some have been particularly successful attracting followers e.g. Mike Massimino and his Behind the Scenes video series <http://www.youtube.com/watch?v=SmzJelUlvv4>. To date there have been no repercussions due to management concerns regarding tweet content. Astronauts are asked to participate but are not required.

TAME Trailer. Cost is \$1K per day for Houston; seeking partnerships. Space is one segment of seven; want to get other disciplines to compete. Would like to replicate across the state and country. TAME currently restricted to TX; model for Challenger Centers.

Promoting NASA. (see attached presentation) **How do we fill the pipeline of future students who want to work for NASA; it's recruitment versus marketing.** It is a related but different discussion: military recruitment is "mission critical" for the country. NASA's Office of Communications was fiscally penalized in the 2007 OMB passback which was really due to OMB's reaction to E/PO activities conducted by one or more of NASA's mission directorate(s). **What do other government agencies spend on raising public awareness and recruiting?** NASA is working to leverage the Communications Coordinating Committee (CCC) to improve communications and coordination of public outreach activities and funding around the agency. **What about leveraging partnerships to "market" NASA?** **Possible recommendation to determine government best practices e.g. IMAX. How does Participatory Exploration fit?**

AA for the Office of Communications/David Weaver. NASA has strong positive branding and public recognition and we are leveraging social media and many assets e.g. iPhone/iPad. The question is what can we do better? Will be researching this over the next few weeks with a focus on ensuring openness, transparency, and responsiveness.

NASA Deputy Administrator/Lori Garver. A new Associate Administrator for the Office of Education will be named soon. With that person in place and the new Office of Communications AA/David Weaver, NASA is positioned to leverage our past education/outreach successes and build on them. While the current situation is challenging, NASA needs to take this opportunity to inform and engage the public. The public has the misperception that NASA is "dying" when in fact our funding increases under the FY11 budget to include new and exciting opportunities for research and exploration and the resulting benefits to the taxpayer i.e. economic growth and technological advancement. We need to get these messages across but we have to be careful how we do it since the current situation is controversial between the White House and the Hill. We need to frame our messages to reach policymakers that NASA is a symbol of peaceful international cooperation in space. NASA has the best stories to tell and we need to tell them. **Suggestion to insert the commercial entrepreneur perspective e.g. analogy of**

IBM view of PC's in the 1970's where NASA has previously been the IBM culture. NASA doesn't take credit for providing leadership to SpaceX etc. The "new kids" are viewed as intruders when they're really additions to the team. NASA protects the American spirit of exploration. In the meantime, we await the final outcome of the debate over the NASA budget between the White House, the House, and the Senate.

Upcoming NAC and Committee Meetings

Committee: Jan 10-14 timeframe at NASA HQ
NAC: Feb 9-11 at NASA HQ

Committee: Apr 26-28 in St. Louis
NAC: May 4-6 at NASA GRC

Committee: July 18th timeframe at NASA ARC
NAC: Aug 3-5 TBD

Committee: October timeframe TBD
NAC: Nov 2-4 TBD